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Second Five-Year Review Report

Tomah Armory Superfund Site Tomah, Wisconsin

September 2006
Pursuant to CERCLA

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9-27-06

Date

Table of Contents

<u>Section</u>	
Table of Contents	2
List of Acronyms	3
Executive Summary	4
Five-Year Review Summary Form	5
I. Introduction	8
II. Chronology	9
III. Background	9
Physical Characteristics	9
Land and Resource Use	9
History of Contamination	9
Initial Response	10
Basis for Taking Action	11
IV. Remedial Actions	11
Remedy Implementation	11
Remedy Modification	12
Operations and Maintenance (O&M)	12
V. Progress Since Last Five Year Review	12
VI. Five Year Review Process	12
Administrative Components	12
Site Inspection	13
Risk Information Review	13
Institutional Controls	13
Document Review	14
VII. Technical Assessment	14
Question A: Is the remedy functioning as intended by the decision documents?	14
Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection still valid?	14
Question C: Has any other information come to light that could call into question the protectiveness of the remedy?	14
Technical Assessment Summary	15
VIII. Issues	15
IX. Recommendations and Follow-up Actions	15
X. Protectiveness Statement	16
XI. Next Five Year Review	16
Attachments	

Figure 1-1 Site Map

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
ARNG	Wisconsin Army National Guard
ATSDR	Agency for Toxic Substances and Disease Registry
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
FIT	Field Investigation Team
HRS	Hazard Ranking System
IC	Institutional Controls
MCL	Maximum Contaminant Level
NCP	National Priorities List
O&M	Operation and Maintenance
PRP	Potentially Responsible Party
RA	Remedial Action
RCRA	Resources Conservation and Recovery Act
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UU/UE	Unlimited Use / Unlimited Exposure
WDNR	Wisconsin Department of Natural Resources

Executive Summary

The remedy for the Tomah Armory Superfund Site in Tomah, Wisconsin was selected in a 1997 ROD. It consisted of No Action, but it did require additional groundwater monitoring. The No Action remedy took into consideration the current and reasonably anticipated future land use. It also took into consideration the fact that institutional controls limiting use of the landfill property were already in existence. The trigger for this five-year review was the last Five-Year review completed on September 27, 2001.

Waste material remains in place within the landfill. Ground water under the landfill no longer shows lead contamination above the MCL. The remedy is expected to remain protective as long as no excavation of landfill material takes place.

The remedy continues to be protective of human health and the environment. The remedy is functioning as intended and is currently protective of human health and the environment because groundwater standards appear to have been met at the property and there appears to be compliance with groundwater use restrictions on the property. Long term protectiveness requires compliance that effective institutional controls are implemented and maintained.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Tomah Armory Superfund Site		
EPA ID (from WasteLAN): WID980820062		
Region: 5	State: WI	City/County City of Tomah
SITE STATUS		
NPL status: Final		
Remediation status Complete		
Multiple OUs? No	Construction completion date: 09/1997	
Has site been put into reuse? NO		
REVIEW STATUS		
Lead agency: US Environmental Protection Agency, Region 5		
Author name: David Linnear		
Author title: Remedial Project Manager	Author affiliation: U.S. EPA	

Review period:** 03/01/2006 to 09/27/2006
Date(s) of site inspection: September 19, 2006
Type of review: Post SARA
Review number: Second
Triggering action: Date of last five-year review
Triggering action date (from WasteLAN): <u>September 27, 2001</u>
Due date (five years after triggering action date): <u>September 27, 2006</u>

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

The first Five-Year Review recommended no need for additional groundwater monitoring, however, waste remains in place.

It was not possible to determine land zoning for the site from ICs.

No monitoring activities have taken place since 2001 preventing a thorough analysis of areas of the site impacted by residual contamination.

In order for the remedy to be protective in the long term, effective ICs must be implemented and maintained.

The site may be eligible for deletion if no contaminations above MCL exist and ICs can in place that will allow usage whether limited or unlimited.

Recommendations and Follow-up Actions:

Continue to monitor for dissolved lead and any other remedy components to ensure protectiveness.

Determine current land zoning for the site area.

Determine areas of the site that may be impacted by residual contamination in the IC plan to be conducted after this Five Year Review.

Develop an IC action plan that includes a provision for evaluating whether effective ICs have been implemented. The IC plan should be developed within 6 months.

We should examine the possibility of eliminating the site from the NPL.

Protectiveness Statement(s):

The remedy continues to be protective of human health and the environment. The remedy is functioning as intended and is currently protective of human health and the environment because groundwater standards appear to have been met at the property and there appears to be compliance with groundwater use restrictions on the property. Long term protectiveness requires compliance that effective institutional controls are implemented and maintained.

Other Comments:

**U.S. Environmental Protection Agency
Region 5
Second Five Year Review Report
Tomah Armory Superfund Site
Tomah, Wisconsin**

I. INTRODUCTION

The purpose of a five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP; 40 FR 300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The United States Environmental Protection Agency (U.S. EPA) Region 5 conducted the five-year review of the remedy implemented at the Tomah Armory Superfund Site in Tomah, Wisconsin. This review was conducted by the Remedial Project Manager (RPM) for the entire Site from March 2006 through September 2006. This report documents the results of the review.

This is the second five-year review for the Site. The triggering action for this statutory review is the date of the first five-year review for the site in September 2001. The five-year review is required because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. This review will be placed in the Site files and local repositories for the Tomah Armory Superfund Site (the "Site") in Tomah, Wisconsin.

II. SITE CHRONOLOGY

Event	Date
Initial Discovery of Problem	1984
NPL final listing	July 21, 1987
Phase I RI/FS Complete	1994
Phase II RI/FS Complete	1997
"No Action" ROD signed	September 1997
First Five- Year Review signed	September 27, 2001
Groundwater Sampling Event (final)	October 2001
Second Five-Year Review Site visit	September 19, 2006

III. BACKGROUND

Physical Characteristics

The Tomah Armory is located in the northeastern section of the City of Tomah, Monroe County, Wisconsin. The site is bordered on the north by the City sewage disposal and treatment facility, to the east by Mill Street and a residential area, to the south by Arthur Street and a telephone museum, and to the west by Woodward Avenue which separates the site from open fields and an apartment complex to the west. Access to the site is not restricted.

Land and Resource Use

The original landfill area covered a significant portion of the area north of Arthur Street to the South Fork of the Lemonweir River in the vicinity of Mill Street and Woodward Avenue. It covered the majority of what is now the Armory property, a portion of the City of Tomah sewage treatment plant property, a portion of a property on which a museum is located and finally a small area west of Woodward Avenue. An area of the museum property was also graded, covered, and reseeded. The small area west of Woodward Avenue was excavated and the excavated material was disposed off-site in the early summer of 1997, for general maintenance purposes. Currently, the site resides in an area that is can be zoned both residential and/or industrial. Current areas of land on the site may have been impacted by residual contamination.

History of Contamination

The Armory Landfill was owned until 1968 by the City of Tomah. Landfill activities occurred at the site from 1950 until sometime between 1955 and 1960. Waste disposal methods consisted of excavation of 6 to 8 feet of surface soil, disposal of waste material in the excavated area, placement of a cover consisting of previously excavated topsoil and a final grading process. Some of the material disposed of in the landfill may have been burned before it was buried. No disposal records regarding the types (residential, commercial, or industrial) or quantities of material buried were maintained.

The Wisconsin Army National Guard (ARNG) purchased a portion of the site in July of 1968 to support Wisconsin ARNG activities associated with the administration, logistical support, and readiness of the unit. The remainder of the site is currently used for operation of the City of Tomah wastewater treatment plant, and the operation of a telephone museum. Prior to the purchase of the property by the ARNG, a portion of the landfill was excavated and disposed off-site in order to construct some Armory buildings.

Ground water in the vicinity of Tomah Armory is currently not used for drinking water purposes. Area residences are connected to municipal water services. Examination of groundwater contamination for evaluations of unlimited use/unrestricted exposure was not determined in the first Five Year Review.

Initial Response

Representatives of the Wisconsin Department of Natural Resources (WDNR) and the U.S. EPA's Field Investigation Team (FIT) investigated the site in 1984 to gain information for a preliminary assessment. A site inspection report was prepared and the site was scored using the Hazard Ranking System (HRS). The site was placed on the National Priorities List (NPL) on July 21, 1987. The possible effects of disposal directly into an aquifer and the potential for direct contact with hazardous substances because of erosion of the landfill cap were the concerns raised during the preliminary assessment.

In January 1988, the Agency for Toxic Substances and Disease Registry (ATSDR) prepared a preliminary health assessment for the site. The assessment lists a number of potential exposure routes including ingestion and dermal contact with ground water, surface water and soils. It also list inhalation of contaminated dusts or volatile compounds. The assessment was completed before the collection of any samples at the site and thus recommended environmental characterization and sampling of the site to address the environmental and human health exposure pathways.

In July 1993, U.S. EPA in cooperation with WDNR and the United States Geological Survey (USGS) conducted a Phase I Remedial Investigation (RI) at the Tomah Armory. The purpose of the Phase I RI was to collect ground water and soil samples to characterize the nature and extent of contamination and associated exposure risks. This characterization would provide a basis for deciding whether further action was necessary at the site.

The Phase I and II RI involved sampling and analysis of ground water, air, subsurface soil, and surface soil to determine site conditions. Groundwater samples were collected from residential and monitoring wells around the site. Subsurface and surface soils were collected from within the landfill area to determine if contamination is present and from outside the landfill area to determine background conditions. A geophysical investigation consisting of a magnetic survey and an electromagnetic survey was conducted to determine the approximate boundaries of the landfill area.

Results of the Phase I RI indicted that additional groundwater and soil sampling was needed to adequately characterize the site. Based on the results, U.S. EPA examined the threats to human health and the environment through exposure by ingestion and/or direct contact with contaminants in the subsurface and surface soils. Groundwater contamination found down gradient of the Tomah Armory was determined to be from a source upgradient to the Tomah Armory. For groundwater contamination

found under the Tomah Armory, U.S. EPA does not believe the groundwater will be used as a drinking water source. The Tomah Armory property and the rest of the City of Tomah are currently served by a municipal water service. Given that the municipal system has adequate capacity for expansion, U.S. EPA believes that any potential future development on-site would use municipal water as well. In addition, since waste material will be left in place and because there is contaminated groundwater under the landfill itself, U.S. EPA proposed groundwater monitoring to ensure the groundwater conditions at the site continue to pose no significant risk.

Research to identify parties responsible for conditions at the Tomah Armory was completed in December 1994. U.S. EPA named the City of Tomah and the Wisconsin Department of Military Affairs as potentially responsible parties (PRPs), based on their ownership and operation of the site. U.S. EPA sent a special notice letter to the PRPs in January 1995, requesting a “good faith” proposal to continue the Phase II Remedial Investigation / Feasibility Study (RI/FS). In February Department of Military Affairs agreed to conduct the Phase II RI/FS. The Phase II RI/FS was completed in 1997.

Basis for Taking No Action

A “No Action” ROD was signed in September of 1997. EPA noted that waste material underlay the surface of the site and that groundwater under the landfill itself did not meet the MCL for lead. Moreover, some organic contamination was found in water under the landfill, but it appeared to come from an upgradient source.

The ROD stated that No Action was required because contamination at the landfill poses no significant risk under the current and reasonable anticipated future land use at this Site. The ROD also stated that although the No Action decision is founded on the fact that no significant risk was determined based upon current and reasonable future land use, protections against inappropriate land use are already in place in the form of restrictive covenants enforceable by WDNR.

Because the area was connected to a municipal water supply and there were land use restrictions in place, preventing excavation, and given the current land use and the reasonably anticipated land use at the Site, EPA concluded that there was little risk of exposure to hazardous substances. Consequently, EPA selected No Action as the remedy, but included in the ROD a requirement for additional groundwater monitoring to ensure that groundwater conditions at the site continued to pose no significant risk.

IV. REMEDIAL ACTIONS

Remedy Implementation

The only implementation involved in this No Action remedy was the completion of additional groundwater monitoring. Results of the groundwater investigation prior to selection of the remedy identified inorganic contaminants inside the boundaries of the landfill and the organic groundwater contamination from a source upgradient from the Armory Landfill site. During the Phase I investigation, inorganic contaminants, most importantly lead, were detected inside the boundaries of the landfill at levels above the federal maximum contaminant level (MCL). Lead was also found in one location outside the boundary of the landfill at a concentration (15.3 µg/l) slightly above the

MCL (15.0 µg/l). Phase II groundwater sampling performed outside the boundaries of the landfill did not detect lead in any wells above the MCL. Organic contaminants in ground water were found inside and outside the boundaries of the landfill. The Phase I sampling detected trichloroethene (TCE) inside the boundaries of the landfill and downgradient at concentrations above the MCL (5 µg/l). The Phase II sampling confirmed the presence of TCE and detected other organic contaminants outside the boundaries of the landfill. However, the Phase II sampling also detected these organic constituents in upgradient wells at greater concentrations. Follow-up to help determine potential sources for the organic contamination, confirmed the presence of a site with leaking storage tanks upgradient to the Armory landfill. The State of Wisconsin took the lead in addressing this source of contamination.

Following selection to the remedy, three rounds of groundwater sampling took place in May 1999, November 1999, and May 2000. Groundwater samples were collected from 3 monitoring wells and analyzed for dissolved lead. In 2000, dissolved lead was not detected above the laboratory limit of quantification in any of the groundwater samples collected.

In October 2001 a final round of sampling was conducted in accordance with the ROD. The results were reported in July 2002 and found that dissolved lead was not detected above the laboratory limit of quantification in any of the groundwater samples collected.

Remedy Modification

There have been no modifications to the remedy.

Operations and Maintenance (O & M)

The site remedial decision was “No Action” and did not have any O & M component.

V. PROGRESS SINCE LAST FIVE YEAR REVIEW

This is the second Five-Year Review for this site. No further remedial actions or enforcement actions have taken place since the initial Five-Year Review. The October 2001 Groundwater Sampling Activity took place and found dissolved lead was not detected. The previous Five-Year Review recommended no need for additional groundwater monitoring and that the site should be deleted from the NPL. Therefore, no further monitoring has taken place.

VI. FIVE YEAR REVIEW PROCESS

Administrative Components

The Tomah Armory Five Year Review was conducted by David Linneer of the U.S. EPA, Remedial Project Manager for the site.

From March 2006 to September 2006, the Project Manager reviewed documents, data, and developed the Five-Year Review report.

The community will be notified of the five-year review by an advertisement in the local newspapers.

Site Inspection

A site inspection was conducted September 19, 2006.

Risk Information Review

Review of the site reports demonstrates that the remedy remains protective of public health and the environment. The purpose of the review was two fold: (1) to confirm that the remedy as spelled out in the ROD remains effective at protecting human health and the environment and (2) to evaluate whether original clean-up levels remain protective of human health and the environment.

Institutional Controls (ICs)

The No Action ROD did not select institutional controls. It concluded that the current land use did not involve an unacceptable risk of exposure to hazardous substances; nor would the reasonably anticipated future use. A copy of the IC instruments referred to in the ROD was not available for this Second Five Year Review. In order to justify restrictive land use due to groundwater contamination the current groundwater status must be examined further.

The ROD stated that No Action was required because contamination at the landfill poses no significant risk under the current and reasonable anticipated future land use at this Site. The ROD also stated that although the No Action decision is founded on the fact that no significant risk was determined based upon current and reasonable future land use, protections against inappropriate land use are already in place in the form of restrictive covenants enforceable by WDNR. Since the site remedy does not allow for unlimited use/unrestricted exposure (UU/UE) then ICs are necessary to ensure the protectiveness of the remedy.

An IC study will be conducted to determine if an effective restrictive covenant is in place such as the performance of title commitment and evaluation of prior encumbrances.

ICs are non-engineered instruments, such as administrative and legal controls that help to minimize the potential to exposure to contamination and that protect the integrity of the remedy. ICs are required to assure long term protectiveness for any area which does not allow for UU/UE. Protectiveness of the remedy relies upon ICs. Therefore, a plan needs to be developed which includes mechanisms to ensure regular inspections of ICs and an annual certification to U.S. EPA that ICs are in place and effective. Included should be a communications plan exploring use of the state one-call system.

A series of IC maps will be developed which depict the areas subject to use restrictions. These maps will overlay the parcels and areas which require land and groundwater use restrictions and the parcels affected by the contamination. These maps will be made available to the public on U.S. EPA's Superfund Data Management System and will serve as an additional IC as an informational control.

An IC plan will be submitted within 6 months which includes a summary of an IC study to determine if ICs are in place and effective at achieving the stated objectives, a map indicating areas where ICs are required and areas where ICs have been implemented and includes recommendations for corrective measures. One component of the IC plan will be an analysis of the groundwater situation at the Site, and a determination concerning whether site contamination justifies continued restriction of groundwater use.

Document Review

For purposes of this review, the ROD, 2001 Five-Year Review, and 2000/2001 Groundwater Sampling Activities were performed and data was reviewed.

VII. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents? YES

The basis for no action in the decision documents continue to apply to the Site.

No activities have been observed that would have violated the intent of the ROD.

The ROD selected “No Action” based on the RI. An IC plan will be developed to evaluate the effectiveness of the existing restrictions.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid? YES

Without a recent groundwater study, it is not conclusive that there have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. Additional groundwater sampling needs to take place.

Changes in Standards and Things to be Considered

The cleanup objectives for the site groundwater have been reviewed, revised and determined to be protective.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

Without a recent groundwater study to determine whether lead contamination under the Site is below MCLs, it is not conclusive that there has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. Additional groundwater sampling needs to take place.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy? NO

There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

VIII. ISSUES

The first Five-Year Review recommended there is no need for additional groundwater monitoring if there was no dissolved lead following the October 2001 sampling event. The October sampling event stated that there was no dissolved lead present in the groundwater. However, waste remains in place and therefore, Five-Year Reviews are required to determine long term protectiveness and deficiencies. In addition, additional groundwater sampling will need to take place.

It was not possible to determine land zoning for the site from ICs.

No monitoring activities have taken place since 2001 preventing a thorough analysis of areas of the site impacted by residual contamination.

In order for the remedy to be protective in the long term, effective ICs must be implemented and maintained.

The site may be eligible for deletion if no contaminations above MCL exist and ICs can in place that will allow usage whether limited or unlimited.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Though the first Five-Year Review recommends no need for additional groundwater monitoring should the 2001 sampling (groundwater monitoring) event reveal no dissolved lead. The recommendation resulting from this second five year review would be to continue to monitor for dissolved lead and any other remedy components to ensure protectiveness, determine usage/exposure and to continue to perform 5-year reviews to ensure these restrictions are maintained. Additional groundwater sampling will be conducted.

Determine current land zoning for the site area.

Determine areas of the site that may be impacted by residual contamination in the IC plan to be conducted after this Five Year Review.

Develop an IC action plan that includes a provision for evaluating whether effective ICs have been implemented, implementing corrective measures where necessary, developing IC maps, and ensuring that effective procedures are in place to ensure regular inspections of ICs at the Site and annual certification to U.S. EPA that ICs are in place and effective, along with the development of a communication plan. The IC plan should be developed within 6 months. The schedule for the remainder of the actions will be determined in the IC plan or as indicated in the table on page 16. The site may be eligible for deletion if no contaminations above MCL exist and ICs can in place that will allow usage whether limited or unlimited.

Recommendations/Follow-up	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects (Current/Future) Protectiveness (Y/N)	
Groundwater Monitoring Reporting / Additional Groundwater Sampling	PRP	U.S.EPA	9/2010	NO	YES
Institutional Control Plan: Deed restrictions and restrictive covenants * (see note below)	PRP	U.S. EPA	3/2007	NO	YES
Determine areas impacted by residual contamination	PRP	U.S. EPA	9/2010	NO	YES
Determine area land zoning for the site	PRP	U.S. EPA	3/2007	NO	YES

* The IC study will determine if ICs are in place and effective at achieving the stated objectives, a map indicating areas where ICs are required and areas where ICs have been implemented and includes recommendations for corrective measures. One component of the IC plan will be an analysis of the groundwater situation at the Site, and a determination concerning whether site contamination justifies continued restriction of groundwater use. Additional groundwater sampling will take place.

X. PROTECTIVENESS STATEMENT

The remedy is protective of human health and the environment. The remedy is functioning as intended and is currently protective of human health and the environment because groundwater standards have been met at the property and there is compliance with groundwater use restrictions on the property. Long term protectiveness requires compliance that effective institutional controls are implemented and maintained.

XI. NEXT FIVE-YEAR REVIEW

The next five-year review will be completed by September 27, 2011, which is five years from the date of this five-year review.

Site Location

Superfund
U.S. Environmental Protection Agency

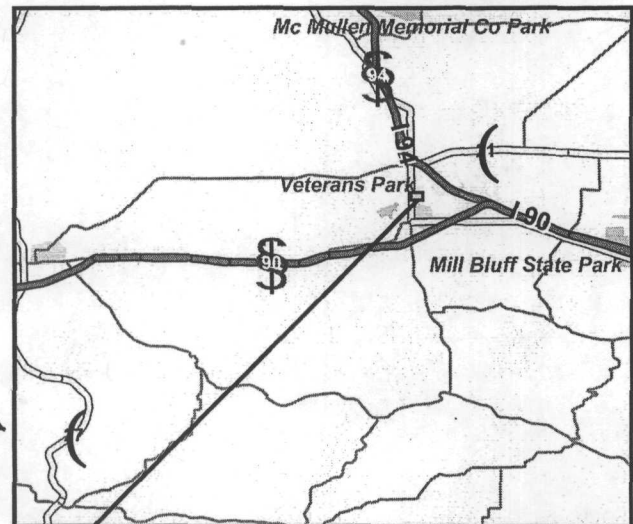


**Tomah Armory
Monroe County, WI**

WID980610299



State



County



Site

Figure 1

Created by Sarah Backhouse
U.S. EPA Region 5 on 8/7/06

Legend

Site Boundary

